March 1975 B75-10005

NASA TECH BRIEF

Lewis Research Center

Computer Program to Generate Engine Inlet Flow Contour Maps and Distortion Parameters

A computer program has been written to generate gas turbine engine inlet flow contour maps and inlet flow distortion parameters based on any array of measurements describing the flow conditions at the engine inlet.

The program generates inlet contour maps with a choice of mapping parameters. To provide contour maps and distortion parameters, interpolation between input measurement locations is done by a technique involving linear interpolation. The contour maps are represented by symbols (numbers and letters) on a picture produced by a line printer. Twenty mapping symbols are used and they are described by a key which accompanies each contour map.

The program generates a variety of simple circumferential and radial distortion parameters that enable the calculation of almost any specific distortion parameter as long as its calculation is based solely on the conditions at the engine inlet. To calculate a specific distortion parameter, the program combines the general parameters calculated by the program, the probe array geometry (part of the input), and any information unique to the specific distortion parameter (inserted by the user) into the desired form.

Notes:

1. The program is written in FORTRAN IV for the IBM 7094 computer.
2. Inquiries concerning this program should be directed to:

   COSMIC
   Information Services
   112 Barrow Hall
   University of Georgia
   Athens, Georgia 30602
   Reference: LEW-12247

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